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METHODS FOR PREPARING BORDEAUX MIXTURE

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Home-made bordeaux mixture is a most valuable and economical spray for the control of plant diseases. Although not used exclusively by growers, it is probably used more than all other fungicides combined. When weather conditions are normal it gives good control of many plant diseases, if properly made and applied.

Bordeaux mixture is a liquid spray made from bluestone (copper sulphate) and either rock or hydrated lime. For best results it should be prepared in wooden pails, barrels, spray tanks, or earthenware crocks instead of metal containers. Use bordeaux mixture as soon as possible after it is made and never mix the concentrated (stock) solutions until ready to use them.

If a large amount of spraying is to be done, it is most convenient to make up separately stock solutions of bluestone and lime. These stock solutions will keep indefinitely. To be certain that the solutions have not become more concentrated after standing indefinite periods because of water lost by evaporation, the surface level should be marked on the inside of the container and any water lost should be replaced and the whole thoroughly stirred before any of the materials are used. (Keep stock solutions covered.)

Mixing Platform:—It is often advisable to construct a mixing platform where bordeaux can be conveniently made. Build the platform in a place convenient to water supply and to the field to be sprayed. The platform should be well built, and high enough to permit the solutions to flow by gravity into the spray tank. Upon this platform should be built a second, smaller platform upon which the stock solutions are made. The smaller platform should be elevated enough to permit the stock solutions to flow into the barrels on the main platform.

STOCK SOLUTION A, BLUESTONE: Dissolve at the rate of 1 pound of bluestone to 1 gallon of water; put 50 pounds of bluestone into a clean bag and suspend it in the top of a 50-gallon barrel of water. It will dissolve over night. Never use a metal container for this purpose. Always stir the stock solution before taking any out.

STOCK SOLUTION B, LIME: Slake 50 pounds of rock lime and dilute it in 50 gallons of water. Be careful not to drown or burn the lime while slaking. Always stir the stock solutions before taking any out. Do not stir the two stock solutions with the same stick.

Hydrated lime may be used in place of rock lime. If hydrated lime is used, it is necessary to use one-half again as much as rock lime. Thus 75 pounds rather than 50 pounds should be used in 50 gallons of water.

Different Strengths of Bordeaux:—Bordeaux of various concentrations may be prepared by using different amounts of the stock solutions in a given amount of water. A formula such as 2-4-50 designates the use of

2 pounds of bluestone (or 2 gallons of stock solution A), 4 pounds of lime (or 4 gallons of stock solution B), and water to make 50 gallons. A 4-4-50 formula is different from 2-4-50 only in that 4 pounds of bluestone (or 4 gallons of stock solution A) are used instead of 2. In this way any desired strength of bordeaux may be made.

Different Amounts of Bordeaux:—The formula for bordeaux mixture usually designates 50 gallons as the unit quantity of water. A 4-4-50 formula designates 4 pounds of copper sulphate, 4 pounds of lime and 50 gallons of water. To prepare 100 gallons of bordeaux at this strength, the formula would read 8-8-100. Larger quantities of other strengths vary likewise, thus 100 gallons of the 2-3-50 formula would require a formula reading 4-6-100. For different amounts of mixture, use multiples of the strength desired.

Be sure to place a fine strainer either over the faucets on the barrels or on top of the spray tank so that all of the liquid will be well strained. This will prevent nozzle trouble in the field.

Simultaneous Method:—Bordeaux mixture is best prepared by mixing the dilute solution of copper sulphate and milk of lime in a third container, each being poured into it simultaneously, and the mixture vigorously agitated. For example: In making 50 gallons of a 4-4-50 mixture, use 4 gallons of stock solution A, diluted to 25 gallons, and 4 gallons of stock solution B, diluted to 25 gallons. Run both of these into the sprayer at the same time with the agitator going.

Dilute Solution Method:—Pour the diluted lime solution into the spray tank, set the agitator going and add slowly the diluted bluestone solution. After both solutions are in the tank, a few minutes agitation completes the preparation.

Stock Solution Method:—This mixture eliminates dilution barrels, as the bordeaux is made in the tank of the sprayer. Start filling the spray tank with water, and when two-thirds full add the required amount of stock solution of milk of lime. Start the agitator. When the tank is three-fourths full, add the required amount of stock copper sulphate solution. By the time the tank is filled the mixture is ready for application.

Instantaneous Method:—By this method the mixture is made in the sprayer tank. The ingredients are: superfine powdered bluestone (snow) and chemical hydrated lime. To prepare 50 gallons of bordeaux mixture by the 4-4-50 formula, weigh out four pounds each of the bluestone and lime. Begin filling the sprayer tank with water with the agitator going. When one-fourth full, put the bluestone on a fine screen to be washed into the tank by the inflowing water. When the tank is three-fourths full, add the lime, dry or in paste form, to the screen and wash into the tank. Keep the agitator going for a couple of minutes after the tank has been filled and the mixture is ready to apply. The bluestone is put in the tank first in this method, so that it will be dissolved before the lime is added.

Test for Free Copper:—Often free copper is present because a poor quality or an insufficient quantity of lime has been used. Such a mixture will burn the leaves of many plants. To test the mixture, add a few drops of a 10 percent solution of potassium ferrocyanide to a small amount of the mixture dipped out of the tank with a glass tumbler or white china cup. If a reddish-brown curd is formed immediately, more lime should be used. If the drops of potassium ferrocyanide added remain a dilute yellow color for several minutes, the mixture is safe.

Temperature:—By using cold water a much better bordeaux mixture is prepared. At 50°F. the mixture will keep a day or two, while at 85°F. it deteriorates rapidly and is of little value after standing several hours.

Preservation:—One heaping tablespoon of sugar dissolved in a cup of water and stirred into 100 gallons of bordeaux mixture will preserve it from deterioration for several days under average conditions.

Combinations:—Bordeaux mixture will combine safely with such insecticides as lead and calcium arsenate, paris green, nicotine sulphate, pyrethrum and derris compounds, oil emulsions, and spreaders and stickers such as penetrol and calcium caseinate.